

# Chapter 1

## INTRODUCTION

### PURPOSE AND SCOPE

The South Florida Water Management District (SFWMD or District) has undertaken development of long-term comprehensive regional water supply plans to provide better management of South Florida's water resources. The purpose of the water supply plans is to develop strategies to meet the future water demands of urban areas and agriculture, while meeting the needs of the environment. This process identifies areas where historically used sources of water will not be adequate to meet future demands, and evaluates several water source options to meet the deficit.

The Kissimmee Basin (KB) Planning Area is one of four regional planning areas, as indicated in **Figure 1**. These regions are generally defined by hydrologic divides. Water supply plans for the planning regions have been sequenced based on their history of water shortage problems.

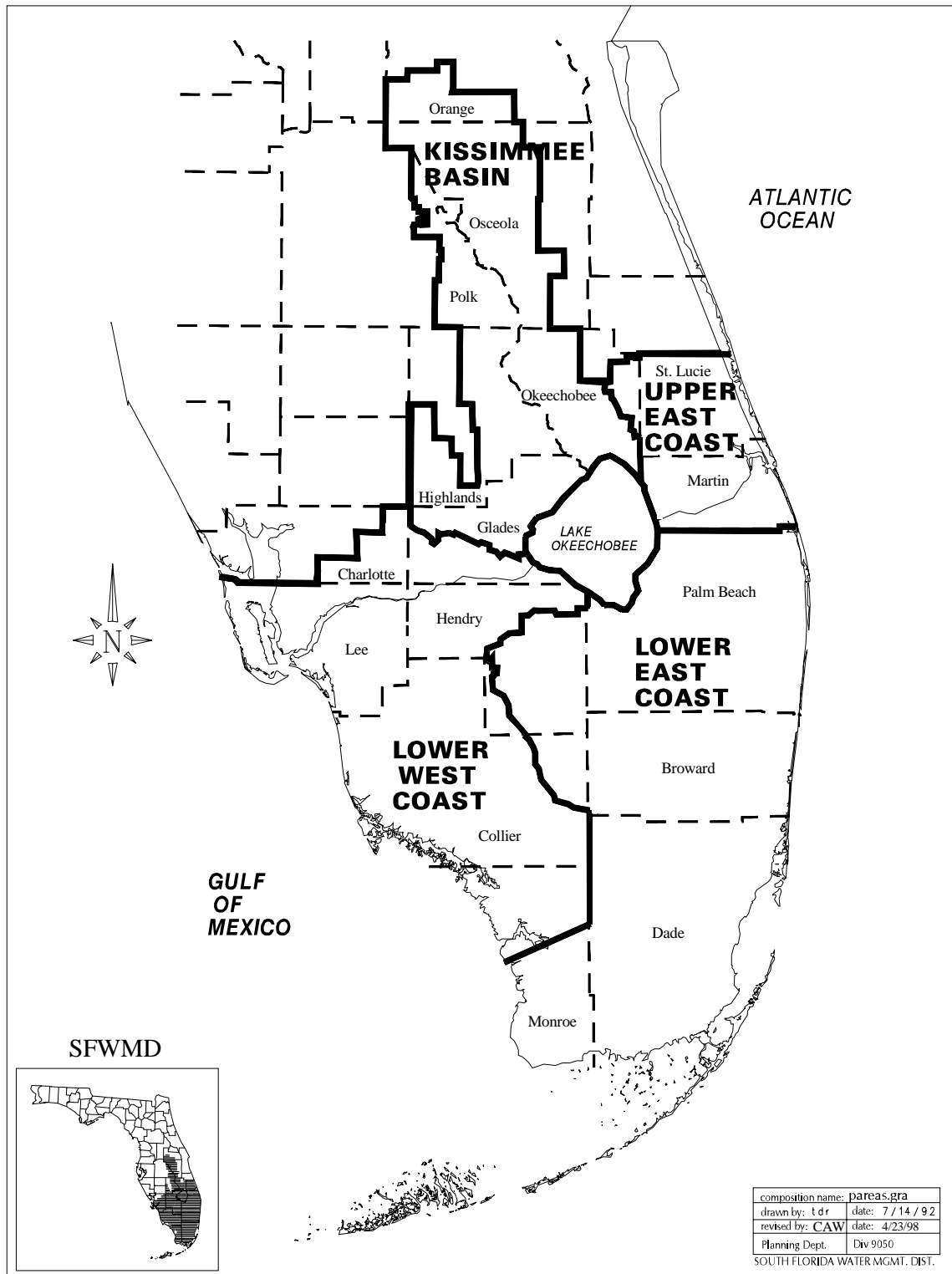
During the 1997 legislative session, significant amendments were made to the Florida Water Resources Act of 1972 (Chapter 373, Florida Statutes) regarding regional water supply planning. These changes required the District to prepare a Districtwide Water Supply Assessment (DWSA) by July 1, 1998, and to then prepare water supply plans for regions that are anticipated to have the potential of demand outstripping available supply by the year 2020. The District had already committed to preparing water supply plans for each of its planning regions, which cumulatively cover the entire District. The DWSA affirmed that commitment. The 1997 amendments also incorporated minimum requirements of water supply plans. In many respects, these amendments also dovetailed with an existing Executive Order, 96-297.

This document includes information, assumptions, and potential water source options to address new statutory requirements through the year 2020. Support Document information was used by the District, advisory committee, other agencies, counties, municipalities, utilities, and various interested parties in the development of the KB Water Supply Plan.

### BASIS OF WATER SUPPLY PLANNING

#### Legal Authority and Requirements

In 1972 the Florida Legislature created the water management districts to manage the state's water resources for various purposes, including water supply. As mentioned above, the 1997 legislature adopted more specific legislation concerning the role of the water management districts in water supply planning and development. The legislative intent is to provide for human and environmental demands, thereby avoiding competition.



**Figure 1.** Regional Planning Areas.

The legal basis of the District's water supply planning program in the KB Planning Area is described in this section. Excerpts of specific Florida statutes and administrative codes cited in this section are provided in Appendix A.

Water supply planning activities were first required of the state's water management districts following adoption of the Florida Water Resources Act of 1972 (Chapter 373, Florida Statutes). The authors of “A Model Water Code” (Maloney et al., 1972), upon which much of Chapter 373 is based, theorized that proper water resource allocation could best be accomplished within a statewide, coordinated planning framework. The State Water Use Plan and the State Water Policy were the primary documents to meet this objective.

With the passage of the legislative amendments, the legislature eliminated the State Water Use Plan and provided for the development of the Florida Water Plan. The Florida Water Plan is required to include the Water Resource Implementation Rule and District Water Management Plans.

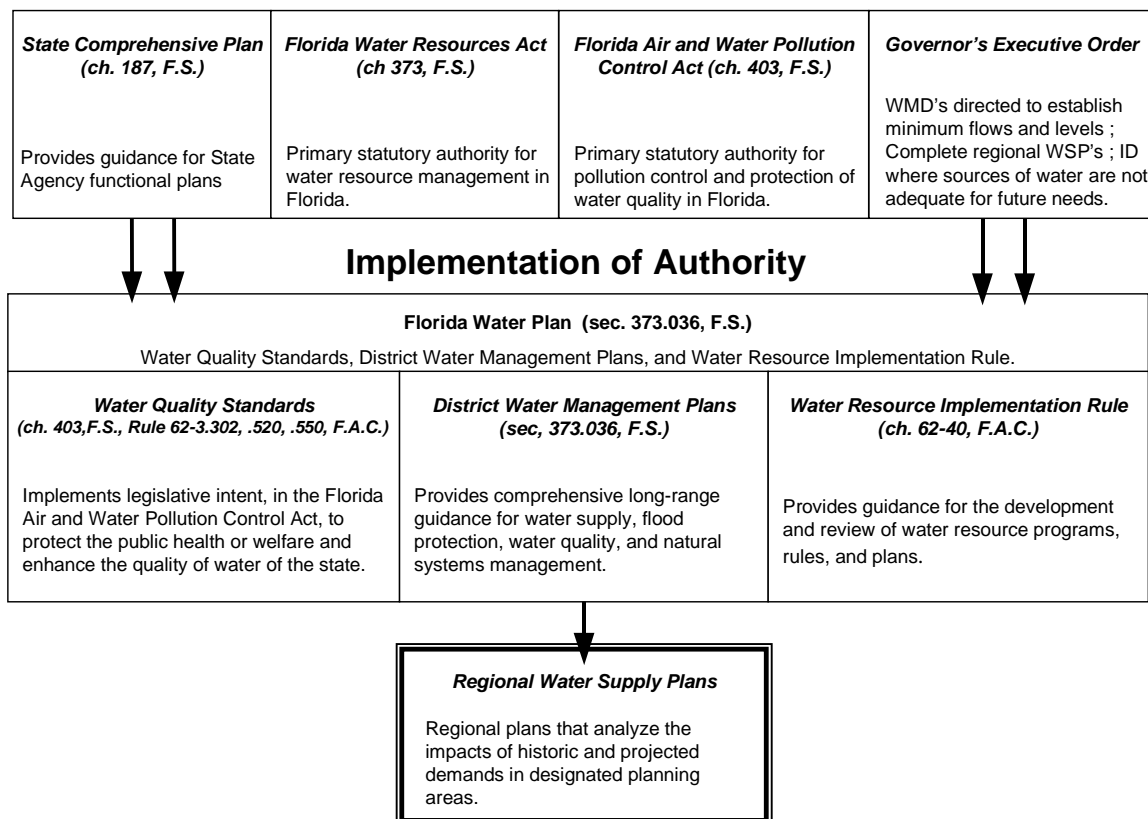
The Water Resource Implementation Rule is intended to guide the FDEP and the water management districts in implementing statutory directives. These directives are prescribed in the Water Resources Act (Chapter 373, F.S.), the Florida Air and Water Pollution Control Act (Chapter 403, F.S.), and, the State Comprehensive Plan (Chapter 187, F.S.). These statutes provide the basic authorities, directives, and policies for statewide water management, pollution control, and environmental protection. The current legal framework for water supply planning is shown in **Figure 2**.

District Water Management Plans are intended to provide comprehensive long-range guidance for the actions of the water management districts in implementing their water supply, water quality, flood protection, and natural system responsibilities under state and federal laws. In addition to other information, the water management plans are required to include a Districtwide water supply assessment. Where the assessment indicates that sources of water are not adequate to meet demands, the development of a regional water supply plan is required. The District preempted this requirement by committing to a water supply planning initiative in the early 1990s that included developing water supply plans encompassing the entire District.

## **Water Supply Planning Initiative**

The District has undertaken a water supply planning initiative to ensure prudent management of South Florida's water resources. This initiative began with the development of a Water Supply Policy Document (1991), and continued with the District Water Management Plan (1995), Districtwide Water Supply Assessment (1998), and regional water supply plans (on going).

## Enabling Legislation



**Figure 2.** Legal Framework for Water Supply Planning.

## Water Supply Policy Document

The District's interpretative summary of the many state statutes and rules governing the uses of surface and ground water in Florida are provided in the Water Supply Policy Document, approved in 1991. The six Water Use Directives, outlined in this document, guide the development of water supply plans:

1. Prevent wasteful, uneconomical, impractical, or unreasonable uses of the water resources.
2. Promote economic development of the water resources consistent with other directives and uses.
3. Protect and enhance environmental resources while providing appropriate levels of service for drainage, flood control, water storage, and water supply.
4. Maximize levels of service for legal users, consistent with other directives.

5. Preserve and enhance the quality of the state's ground and surface waters.
6. Develop and maintain resource monitoring networks and applied research programs (such as forecasting models) which are required to predict the quantity and quality of water available for reasonable-beneficial uses.

The KB Plan vision, goal and objectives conform to the principles established in these Directives.

### **District Water Management Plan**

The District approved the initial District Water Management Plan (DWMP) in April 1995, which incorporated information from the Needs and Sources Document. One outcome of new legislative revisions of Section 373.036, F.S., in 1997 was that the District would be required to develop a district water management plan that is representative of an overall strategy for future planning and implementation activities. As mentioned above, the DWMP will provide a comprehensive examination of the complex issues of water supply, flood protection, water quality, and natural systems management in South Florida. Based on the 20-year planning period, the DWMP incorporates established schedules for future District planning activities.

The DWMP update (anticipated by mid-2000) includes: scientific methodologies used in the establishment of minimum flows and levels (Section 373.042, F.S.); planning region boundaries; and revised technical data and information (Section 373.0391 and Section 373.0395). Data and recommendations are included from both the KB Water Supply Plan and the Districtwide Water Supply Assessment (July 1998). The District compiles an annual DWMP progress report on project status, performance measures, and funding requirements.

### **Districtwide Water Supply Assessment**

Section 373.036, F.S., requires water management districts to prepare assessments of water needs and supply sources. The District, through discussions with the FDEP, bifurcated this process, and prepared a Districtwide needs and sources analysis followed by regional water supply plans. The Water Supply Needs and Sources Document (July 1992) made a preliminary analysis of the District's water demand and available resources. The significant role of this initial document was to provide information to local governments pursuant to Section 373.0391 and Section 373.0395, F.S., and to facilitate the completion of the District Water Management Plan. As a current data source, the Districtwide Water Supply Assessment (July 1998) (DWSA) presents a composite of water demands for 1995, projections for 2020, and descriptions of surface water and ground water resources within each planning area. The water demands and projections within this KB Water Supply Plan Support Document were made in conjunction with the DWSA.

## **Regional Water Supply Plans**

Regional water supply plans provide more detailed region-specific information than the water supply assessments. Water supply plans are based upon data that are related to the specific water needs, sources and environmental features of regional planning areas, and are updated every five years. Area-specific goals and objectives are developed for each region during the water supply planning process.

## **Incorporation of State Directives into District Water Supply Goals**

The District is committed to an overall goal in water supply plans, that is derived from the State Comprehensive Plan:

Florida shall assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and shall maintain the functions of natural systems and the overall present level of surface and ground water quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards.

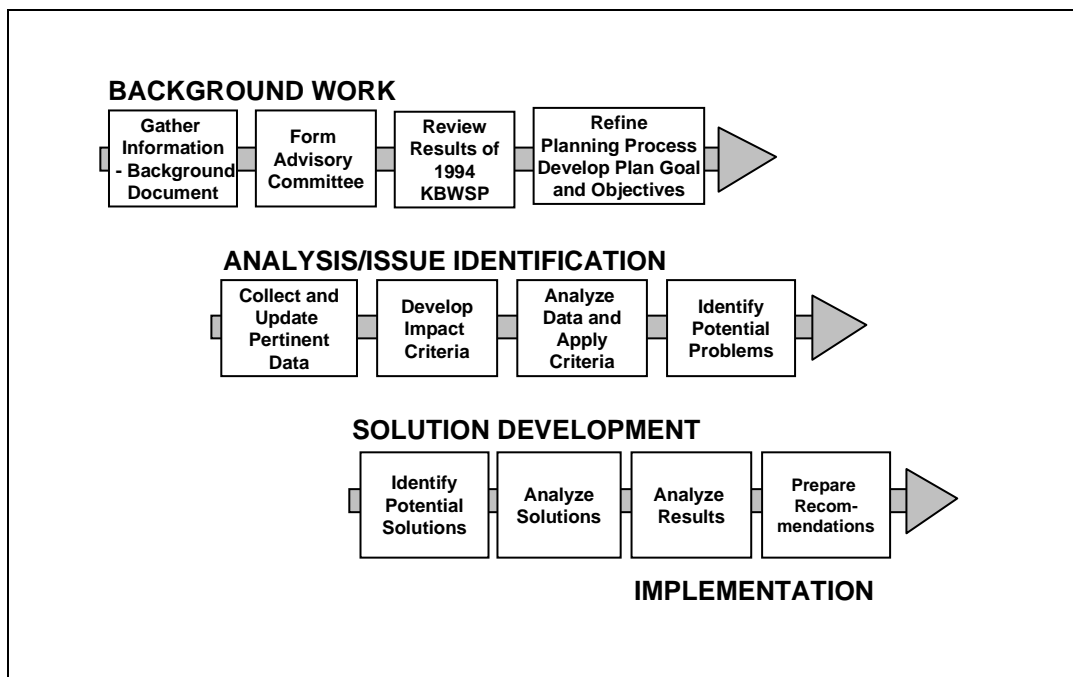
District water supply plans seek conformity to the six Water Use Directives from the Water Supply Policy Document (1991), referenced earlier in this chapter, to achieve the state's overall water supply goal. The state's policies endorse conservation of available supplies, diversification of potential supply sources, protection and enhancement of water quality, and protection of environmental resources. At the same time, the state and the District are required to meet the water resource needs of the region's population, and to provide clean water for drinking, other domestic uses, and agriculture. This goal is reflected in the planning process of the KB Water Supply Plan.

## **THE PLANNING PROCESS**

The KB water supply planning process consists of three overlapping phases: (1) background work; (2) analysis/issue identification; and (3) solution development (**Figure 3**). Advisory committee meetings were held to facilitate the planning process. The advisory committee participated in various activities involving: initial information sharing; issue identification; vision, goal, and objective formulation; development of the plan's resource protection criteria; interpretation of modeling results; identification of possible solutions; strategy development; and, review of draft plan document.

### **Background Work**

Background work included gathering information for the region describing water resources, rainfall patterns, natural resources, historical and projected water demands, water conservation programs, and land use coverage that could be useful in developing the plan. This information was compiled into this Support Document and Appendices. The background work also included use of three regional ground water models for the (1) Metro-Orlando Area, (2) Osceola County, and (3) Glades, Okeechobee, and Highlands



**Figure 3.** The Kissimmee Basin Planning Process.

counties. In addition, a surface water budget assessment was developed for the Lake Istokpoga-Indian Prairie Basin. Model preparation involved the assembly of substantial amounts of information, including statistical analyses of rainfall events in the region, and descriptive data pertaining to aquifer characteristics such as transmissivity.

An advisory committee was established to provide public input throughout the planning process. The primary function of the advisory committee was to provide assistance to the District in the identification and clarification of basin issues, development of acceptable impact criteria, solution identification, and preparation of the plan recommendations presented in this report. The role of the advisory committee is considered to be a key element in the development of this plan and through their assistance, it is hoped that the recommendations contained in this plan will be more agreeable by the public during implementation. The advisory committee is discussed in the Public and Agency Participation section, later in this chapter.

## Plan Vision

The advisory committee adopted the water resource goal of the State Comprehensive Plan (Chapter 187, F.S.) as the overall vision for the KB Water Supply Plan:

Florida shall assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and shall maintain the functions of natural systems and the overall present level of surface and ground water quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards.

This vision advances the six principal Water Use Directives from the Water Supply Policy Document (1991), referenced earlier in this chapter.

## Plan Goal

To ensure that the KB Water Supply Plan addresses the specific needs of the region, the committee developed the following goal:

Identify sufficient sources of water and funding to meet the needs of all reasonable-beneficial uses within the KB Planning Area through the year 2020 during a drought event that has the probability of occurring no more frequently than once every ten years, while sustaining the water resources and related natural systems.

## Plan Objectives

To ensure the Kissimmee Basin Water Supply Plan addresses the specific needs of the region, the advisory committee developed the following regional objectives (no implied priority):

- **Water Sources:** Optimize the use of all water sources
- **Natural System Protection:** Protect natural systems from harm due to water uses
- **Level of Certainty:** Identify options that will provide a 1-in-10 year level of certainty for all existing and projected reasonable-beneficial uses
- **Compatibility with Local Governments:** Promote compatibility of the Kissimmee Basin Water Supply Plan with tribal and local government land use decisions and policies
- **Linkage with Other Regional Planning Efforts:** Promote compatibility and integration with other related regional water resource planning efforts, including, but not limited to, Kissimmee River Restoration, Kissimmee Chain of Lakes, the Restudy, and Southwest Florida Water Management District and St. Johns River Water Management District water supply planning efforts without detriment to the Kissimmee Basin region
- **Conservation of Water Sources:** Promote water conservation and efficient use of water sources
- **Water Supply Demands:** Refine water supply demand projections for all reasonable-beneficial uses for average year and the 1-in-10 year level of certainty
- **Funding:** Identify adequate sources of funding to support water resource development and water supply development options identified in the plan



- **Water Resource Protection:** Protect water resources (aquifers, rivers, and lakes) from harm due to water uses, including preventing harmful movement of saline water within the Floridan Aquifer System as a result of water use

The goal and associated objectives captured the expectations and issues in the KB Planning Area, and in turn, provided direction for the planning process. Topics scheduled for committee discussion, research and analytical work, and the formulation of final recommendations centered on these objectives. Completion of the plan's initial goal and objectives marked the transition into the analytical phase of the process.

## **Analysis/Issue Identification**

The identification of potential problem areas was accomplished by comparing the results of the 2020 water use ground water and surface water simulations, to the resource protection criteria that were developed. Where areas of possible concern were identified through this process, solutions were discussed and strategies were developed. Where necessary, the developed analytical tools were applied to test the effectiveness of the proposed solutions.

## **Solution Development**

In areas where projected demands had the potential to exceed available supplies, there was a need to devise possible solutions. Potential solutions included increased use of water conservation and water source options which are described in Chapters 7 and 8. Each water source option was discussed and evaluated by the committee, including the identification of related local and regional responsibilities.

## **Implementation**

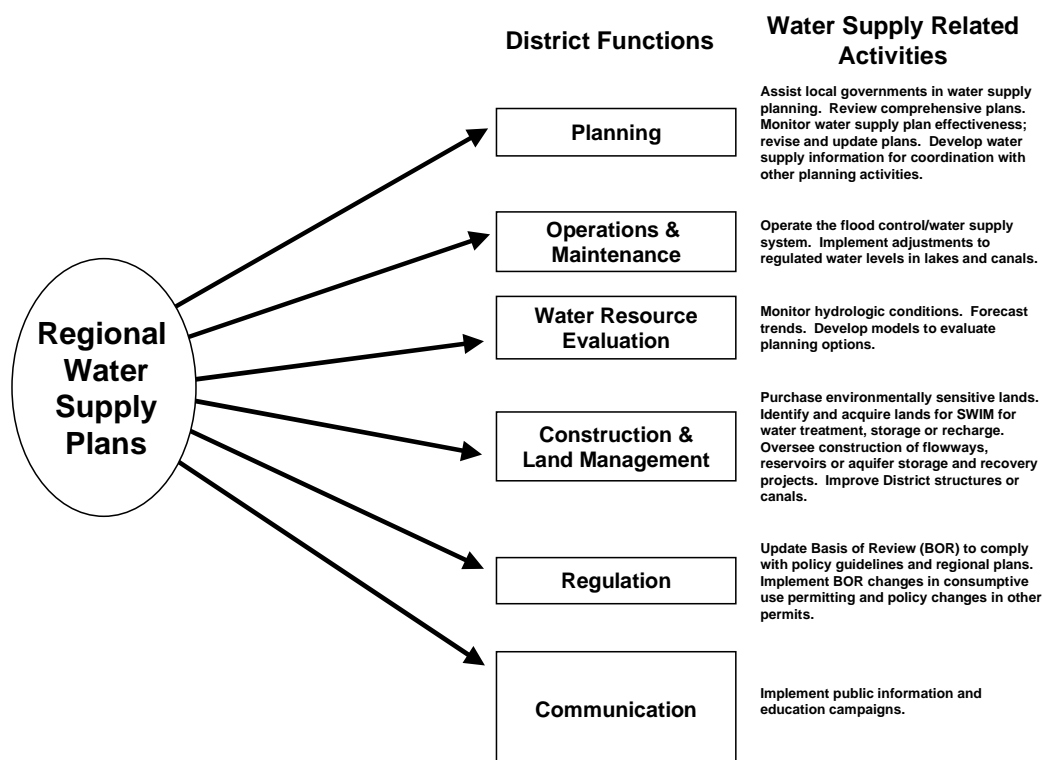
Concepts resulting from the solution development phase will be translated into implementation and funding strategies through various functions within the District (**Figure 4**). Developing strategies, identifying funding sources and building partnerships for future implementation efforts will be emphasized.

## **COORDINATION**

Development of the KB Water Supply Plan was coordinated with several other planning efforts in the region, as well as with many other entities, to ensure an integrated approach and compatibility with local and regional plans.

## **Related Planning Efforts**

Water management planning efforts in the KB Planning Area include a variety of interrelated studies and activities, in both the public and private sectors. Each plan or



**Figure 4.** District Water Supply Implementation Activities.

study addresses unique water management issues while maintaining close relationships with water supply planning (**Table 1**).

The related efforts with the most significant influence on the implementation of the KB Water Supply Plan include the Comprehensive Everglades Restoration Plan (CERP) and the establishment of minimum flows and levels to several lakes in the Kissimmee Basin. The CERP will address the regulation schedule of Lake Istokpoga and the amount of water potentially available from the lake. This plan will also consider construction of storage (reservoirs and/or ASR) north of Lake Okeechobee, primarily for water quality purposes. These facilities will influence recommendations regarding the use of Lake Istokpoga and Lake Okeechobee as water sources in the Lake Istokpoga-Indian Prairie Basin. In addition, establishing minimum flows and levels for the 12 lakes will more clearly define the quantity of water available for consumptive uses (these recommendations are further described in Chapter 5 of the Planning Document).

Other water supply planning efforts within the SFWMD include the Upper East Coast, Lower West Coast, and Lower East Coast water supply plans. The Upper East Coast Water Supply Plan is in its third year of implementation while the remaining plans were approved by the Governing Board in April 2000. A common issue of the Kissimmee Basin and these other plans is the use of water from Lake Okeechobee as a water supply source.

**Table 1.** Kissimmee Basin Related Water Management Planning Efforts.

	<b>Scope/Primary Goal</b>	<b>Relationship to KB Water Supply Plan</b>	<b>Timeframes</b>
KB Water Supply Plan	Adequate and reliable water supply	N/A	2000
Kissimmee Chain of Lakes Water Management Plan	Environmental enhancement of Kissimmee Chain of Lakes	Changing lake regulation schedules	Final plan FY99
Kissimmee River Restoration	Environmental restoration of Kissimmee River floodplain. Improved surface water quality.	Changing deliveries to Lake Okeechobee	2015
Lake Okeechobee SWIM Plan	Protection and enhancement of Lake Okeechobee and its watershed (water quality)	Discharge water quality and nutrient loading from the Kissimmee River	Update completed 1997. Next update 2000.
Lake Okeechobee Regulation Schedule Environmental Impact Study	Evaluates environmental and economic impacts associated with proposed Lake Okeechobee Regulation Schedules (quantity)	Discharge quantity from the Kissimmee River	1999
C&SF Project Restudy	Comprehensive review of environmental impacts of C&SF project	Lake Okeechobee storage and treatment, including reservoirs and aquifer storage and recovery	1995-1999
Comprehensive Everglades Restoration Plan	Implementation of C&SF Project Restudy	Lake Istokpoga Regulation Schedule, potential construction of reservoirs and ASR system north of Lake Okeechobee	2000-2050
Kissimmee Basin Minimum Flows and Levels	Prevent significant harm to the water resources and ecology of surface water resources in the Kissimmee Basin	MFLs will more clearly define the quantity of water available for consumptive uses. Recovery or prevention strategy has potential to alter future water management activities, including use of water resources in the Kissimmee Basin	2004-2006

## **Intergovernmental Agreements**

Two existing intergovernmental agreements in the KB Planning Area that facilitate coordination between the SFWMD and other entities are the Memorandum of Understanding between the SFWMD, SJRWMD, and SWFWMD; and the agreement between the SFWMD and Seminole Tribe.

The purpose of the Memorandum of Understanding is to establish processes by which water resource investigations, planning, regulation and water shortage efforts may be coordinated and consistently applied between the three districts. The agreement with the Seminole Tribe outlines surface water control strategies to the Brighton Reservation to assure maximum reliability of surface water deliveries to meet the Tribe's entitlement. These agreements are discussed in further detail in Chapter 5.

In addition, the District will coordinate the implementation of the Kissimmee Basin Water Supply Plan with local governments/utilities, the Lower East Coast Regional Water Supply Plan, the C&SF Comprehensive Review Study, the Comprehensive Everglades Restoration Plan (the implementation phase of the C&SF Restudy), and other related efforts to promote compatibility.

## **PUBLIC AND AGENCY PARTICIPATION**

Public and agency involvement was critical in the preparation of the KB Plan. The steps listed below were taken by the District to ensure adequate public input.

### **Advisory Committee**

A 24 member advisory committee, with approximately 17 alternate members, was created to obtain public participation in the planning process. Membership included representatives of federal, state and local agencies, planning officials, public water supply utilities, local business community, environmental interests, community leadership, and agricultural concerns. Each of the advisory committee meetings were advertised and open to the public.

The primary role of the committee, as well as the general public who attended these meetings, was to provide input at each stage of the water supply planning process, contribute local knowledge and expertise, and to reflect the collective concerns and interests of various stakeholders in the KB Planning Area. The role of District staff was to facilitate the planning process, provide professional and technical support and guidance, and prepare the planning document with committee input.

The advisory committee spent the initial monthly meetings listening to background presentations, sharing information and improving the District's understanding of the local issues, along with developing of the plan's goals and objectives. The goals and objectives established by the advisory committee served as a "road map" for the subsequent planning process. Topics scheduled for committee discussion, research and

analytical work, and formulation of final recommendations all centered on these goals. Completion of the plan's initial goals marked the transition into the analytical phase of the process.

The advisory committee was instrumental in providing input on utility demands and identifying resource protection criteria. The advisory committee met a total of 17 times between November 1998 and April 2000. After plan approval, committee members will continue to be informed of the implementation activities through newsletters or periodic status meetings, and the Five Year Water Resource Development Work Program based on the KB Water Supply Plan.

In addition, a subcommittee or focus group to the advisory committee was formed to evaluate options and develop recommendations for issues associated with surface water availability in the Lake Istokpoga-Indian Prairie Basin. The focus group was composed of agricultural water users, the local government for Highlands County, local lake interest groups, representatives of the Seminole Tribe and members of the public. The focus group drew upon their local knowledge and experience with Lake Istokpoga and the Indian Prairie Canal system to formulate water supply strategies and recommendations. This focus group met four times during the period of May 1999 to January 2000.

The focus group was instrumental in providing input on projected agricultural water use and formulation of the water source options and strategies for the region. The group also provided critical review of the results of a surface water management analysis upon which the water source options were evaluated. The final water source options and associated recommendations were brought back to the full advisory committee prior to plan approval.

## **Data Confirmation**

The technical information incorporated into this Support Document was the basis for discussions of water demand and availability in the KB Planning Area; it was also the key data for analysis (i.e., predictive modeling and analysis of water management alternatives) of the water resources. Therefore, it is important that this information is accurate so that the most appropriate solutions are presented.

As part of the data collection effort, many entities, such as local governments, state and federal agencies, environmental groups, agricultural interests, and utilities within the KB Planning Area, were contacted to gather initial input and information, and informal meetings were held with several of these groups. Two examples where public input was utilized to generate and/or confirm information were the utility information and the population and urban demand projections.

## **Utility Information**

To accurately reflect historic, current and projected water supply practices by the utilities in the KB Planning Area, the District initiated an exhaustive survey of all regional

public and private water and wastewater utilities in the study area in 1996. The utilities were sent a questionnaire addressing existing and future customers, service areas, treatment technologies, average daily flows, treatment plant locations, number of wells, interconnects with other utilities, and planned expansions for their respective utilities. Follow up telephone calls were made to those utilities who did not respond, or whose response was incomplete.

This information was tabulated in a computerized spreadsheet and checked against other District sources, such as permits and comprehensive planning documents, for accuracy. Where inaccuracies were found, additional follow up contacts were made.

### **Population and Urban Demand Projections**

As part of the work completed under the Districtwide Water Supply Assessment (DWSA), U.S. Census data for 1995 and 1990 were used as the basis for 1995 total population and population distribution. Population was further broken down by utility service area and adjusted to account for estimates of self supply. Per capita water use estimates were determined by dividing utility raw water production by population. The District developed per capita water demand calculations were submitted to local governments and utilities for their review.

Population estimates published by the Bureau of Economic and Business Research (1998) were used for the estimate and distribution of 2020 projections. The per capita use rates determined for each utility for 1995 were multiplied 2020 population estimates to approximate future PWS demand. These estimates were again sent to the local government and utilities for conformation of the demand and distribution among their various water plants and wells. Appendix F provides a detailed description of the source and use of the population estimates.